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10/814,847	03/30/2004	Yoshifumi Nishida	SON5180.41A1	6496

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EXAMINER	
ADDY, ANTHONY S	

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/814,847	NISHIDA ET AL.	
	Examiner	Art Unit	
	Anthony S. Addy	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/30/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The references listed in the Information Disclosure Statement filed on March 30, 2004 have been considered by the examiner (see attached PTO-1449 form or PTO/SB/08A and 08B forms).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-7, 10-16, 25-34 and 36-47 are rejected under 35 U.S.C. 102(e) as being anticipated by **Liu et al., U.S. Patent Number 6,934,257 (hereinafter Liu)**.

Regarding claim 1, Liu discloses an apparatus for performing data packet transfers over a network (see abstract, col. 1, line 61 through col. 2, line 3 and Fig. 1), comprising: a network interface configured for communication over a network according to a layered communication protocol; a media access communication (MAC) layer within said network interface (see col. 2, lines 18-23 and Fig. 2); and means for optimizing data transfers as controlled from within said MAC layer by formatting network packets and performing partial packet retransmissions, and/or the suppression of unnecessary packet acknowledgments (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 2, Liu discloses an apparatus for performing data packet transfers over a network (see abstract, col. 1, line 61 through col. 2, line 3 and Fig. 1), comprising: a network interface configured for communication over a network according to a layered communication protocol; a media access communication (MAC) layer within said network interface (see col. 2, lines 18-23 and Fig. 2); and at least one optimization process executing within said MAC layer and configured for formatting and processing network packets; wherein said processing comprises (i) performing partial packet retransmission, and/or (ii) suppressing unnecessary packet acknowledgments (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 3, Liu discloses all the limitations of claim 2. In addition, Liu discloses an apparatus, wherein said network interface comprises a transport control protocol (TCP) packet queue configured for retaining a plurality of network packets (see col. 6, lines 23-33 and Fig. 4).

Regarding claim 4, Liu discloses all the limitations of claim 2. In addition, Liu discloses an apparatus, wherein said partial packet retransmission system is configured for dividing a network packet frame into a plurality of data blocks including a first plurality of retransmission data blocks for retransmissions between a sender and a receiver (see col. 6, lines 10-36).

Regarding claim 5, Liu discloses all the limitations of claim 4. In addition, Liu discloses an apparatus, wherein said plurality of data blocks further includes a second plurality of payload data blocks configured for transmitting payload information from said sender to said receiver (see col. 3, lines 26-32).

Regarding claim 6, Liu discloses all the limitations of claim 5. In addition, Liu discloses an apparatus, wherein said plurality of data blocks further comprise checksum data for recovering data bit errors in said plurality of data blocks for increasing the reliability of the transmission of said plurality of data blocks (see col. 3, line 60 through col. 4, line 7 and col. 6, lines 44-52).

Regarding claim 7, Liu discloses all the limitations of claim 6. In addition, Liu discloses an apparatus, wherein said checksum data is implemented in a software scheme (see col. 6, lines 44-52 and col. 10, lines 28-32).

Regarding claim 10, Liu discloses all the limitations of claim 2. In addition, Liu discloses an apparatus, wherein the ACK suppression system is configured to modify said MAC layer to allow ACK packet suppression in the network (see col. 3, lines 38-64, col. 9, lines 39-55 and col. 10, lines 13-27).

Regarding claim 11, Liu discloses all the limitations of claim 10. In addition, Liu discloses an apparatus, wherein said ACK suppression system speeds the transfer of network data for each ACK packet deleted in the TCP packet queue in the network (see col. 3, lines 38-64).

Regarding claim 12, Liu discloses all the limitations of claim 10. In addition, Liu discloses an apparatus, wherein said ACK suppression system is configured to piggyback unreceived data blocks transmitted in a first of said plurality of data blocks partially transmitted within a second of said plurality of data blocks transmitted subsequent to the first when the sender receives a partial acknowledgment from the receiver (see col. 3, lines 38-64, col. 9, lines 39-55 and col. 10, lines 13-27).

Regarding claim 13, Liu discloses all the limitations of claim 12. In addition, Liu discloses an apparatus, wherein said ACK suppression system is configured for having said sender retransmit the entire data frame if said sender receives a negative acknowledgment from the receiver for a transmitted data frame, and as long as the retransmission does not exceed a maximum retransmission time (see col. 3, lines 38-64, col. 9, lines 39-55 and col. 10, lines 13-27).

Regarding claim 14, Liu discloses all the limitations of claim 13. In addition, Liu discloses an apparatus, wherein said data frame comprises a data frame formatted according to the IEEE 802 standard (see col. 4, lines 3-22 and Fig. 3).

Regarding claim 15, Liu discloses all the limitations of claim 13. In addition, Liu discloses an apparatus, wherein said data frame is a Transmission Control Protocol (TCP) formatted data frame (see col. 4, lines 3-22 and Fig. 3).

Regarding claim 16, Liu discloses a method of optimizing network data transfer, comprising: dividing a network packet frame into a plurality of data blocks (see col. 6, lines 10-36 [*i.e. dividing the TCP packets into a plurality of TCP fragments reads on dividing a network packet frame into a plurality of data blocks*]); partially retransmitting untransmitted data blocks in said plurality of data blocks corresponding to the network packet frame (see col. 3, lines 38-64 and col. 6, lines 10-36); and suppressing portions of said plurality of data block transmit acknowledgments between a sending node and a receiving node by deleting transmit acknowledgments that do not deleteriously affect communication performance between said sending node and said receiving node (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 25, Liu discloses all the limitations of claim 16. In addition, Liu discloses a method, wherein said acknowledgment suppression system is configured to periodically check the network queue and to delete packet acknowledgments in the network queue (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 26, Liu discloses all the limitations of claim 25. In addition, Liu discloses a method, wherein said packet acknowledgments comprise transport control protocol (TCP) acknowledgments (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 27, Liu discloses all the limitations of claim 26. In addition, Liu discloses a method, wherein said acknowledgment suppression system is configured for reducing the number of acknowledgments transmitted in bursts, thereby mitigating self-contention within the transport control protocol (TCP) communication (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 28, Liu discloses all the limitations of claim 27. In addition, Liu discloses a method, wherein said acknowledgment suppression system is configured to determine whether an acknowledgment is unnecessary in the network packet queue so that these unnecessary packets can be deleted from the transport control protocol (TCP) packet queue (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 29, Liu discloses all the limitations of claim 28. In addition, Liu discloses a method, wherein said acknowledgment suppression system is configured to not delete the acknowledgment packet from the transport control protocol (TCP) packet queue when it is determined that said acknowledgement sequence number in the

transport control protocol (TCP) packet queue is equal to the sequence number in the most recent TCP acknowledgment (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 30, Liu discloses a network data transfer optimization system for optimizing network packet communications between two-non-identical networks (see abstract, col. 4, lines 44-48 and Fig. 2), the system comprising: a network packet data formatting unit configured for formatting network packets into frames for transmission from a first network to a second network (see col. 1, line 61 through col. 2, line 3, col. 4, lines 23-34 and Fig. 2); a network packet retransmission unit configured for partially retransmitting unreceived data blocks in the network packets between said first network and said second network (see col. 3, lines 38-64 and col. 6, lines 10-36); and a network packet suppression unit configured for deleting a number of unnecessary network acknowledgment packets corresponding to network packets transmitted between said first network and said second network to enable a network connection to said first network (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 31, Liu discloses all the limitations of claim 30. In addition, Liu discloses a system, wherein said first network comprises a network based on the transport control protocol (TCP) (see col. 1, line 61 through col. 2, line 3 and Fig. 2).

Regarding claim 32, Liu discloses all the limitations of claim 30. In addition, Liu discloses a system, wherein said second network comprises a network based on an IEEE 802 wireless standard (see col. 1, line 61 through col. 2, line 3, col. 4, lines 23-34 & 44-48 and Fig. 2).

Regarding claim 33, Liu discloses all the limitations of claim 30. In addition, Liu discloses a system, wherein said network packet data formatting unit is configured for formatting a data packet of said first network into a plurality of data blocks for transmission to said second network (see col. 3, lines 26-32).

Regarding claim 34, Liu discloses all the limitations of claim 33. In addition, Liu discloses a system, wherein said plurality of data blocks includes checksum data for determining whether a particular data block is corrupted or uncorrupted (see col. 3, line 60 through col. 4, line 7 and col. 6, lines 44-52).

Regarding claim 36, Liu discloses a wireless network (see Fig. 2), comprising: a first network having a first network transport protocol; a second network having a second network transport protocol which differs from said first network transport protocol (see col. 1, line 61 through col. 2, line 3, col. 4, lines 23-34 & 44-48 and Fig. 2); and a network data transfer optimization system coupled to a media access control layer of said second network and configured for optimizing data transfer between network nodes in said first network and said second network (see col. 3, lines 38-64 and col. 9, lines 39-55).

Regarding claim 37, Liu discloses all the limitations of claim 36. In addition, Liu discloses a wireless network, wherein said first network protocol comprises transport control protocol (TCP) (see col. 1, line 61 through col. 2, line 3 and Fig. 2).

Regarding claim 38, Liu discloses all the limitations of claim 36. In addition, Liu discloses a wireless network, wherein said second network protocol comprises an IEEE 802 standard wireless network transport protocol (see col. 4, lines 24-48).

Regarding claim 39, Liu discloses all the limitations of claim 36. In addition, Liu discloses a wireless network, wherein said first network is an Ethernet network (see col. 4, lines 24-48).

Regarding claim 40, Liu discloses all the limitations of claim 36. In addition, Liu discloses a wireless network, wherein said second network is an IEEE 802 standard wireless network (see col. 4, lines 24-48).

Regarding claim 41, Liu discloses all the limitations of claim 36. In addition, Liu discloses a wireless network, wherein said data transfer optimization system comprises a network data formatting unit configured for formatting network data packet frames transmitted in said second network (see col. 4, lines 13-22).

Regarding claim 42, Liu discloses all the limitations of claim 41. In addition, Liu discloses a wireless network, wherein said data transfer optimization system further comprises a network data packet retransmission unit configured for retransmitting partial data packets corresponding to the network data packet frames transmitted from a sending node to a receiving node when the network data packet frames include corrupt or unrecoverable data blocks (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 43, Liu discloses all the limitations of claim 41. In addition, Liu discloses a wireless network, wherein said data transfer optimization system further comprises a network data packet transmission acknowledgment suppression system configured for removing duplicate or unnecessary data packets from a network data

queue to enable a transport control protocol (TCP) connection (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 44, Liu discloses all the limitations of claim 42. In addition, Liu discloses a wireless network, where said network data packet retransmission unit is configured for dividing up said network data packet frame into data blocks including a media access control layer header having information to enable the data packet frame to be transmitted between said first network and said second network (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 45, Liu discloses all the limitations of claim 44. In addition, Liu discloses a wireless network, wherein said data blocks further comprise checksum information for improving the reliability of data transmission between said first network and said second network (see col. 3, line 60 through col. 4, line 7 and col. 6, lines 44-52).

Regarding claim 46, Liu discloses all the limitations of claim 44. In addition, Liu discloses a wireless network, wherein said data transfer optimization system is configured for piggybacking corrupted or unrecoverable data blocks from a first data packet transmission into a second data frame transmission to complete the transmission of said first data packet (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 47, Liu discloses all the limitations of claim 43. In addition, Liu discloses a wireless network, wherein said network data packet transmission acknowledgment suppression system is configured to not delete an acknowledgement

from the packet queue if its sequence number being transmitted in a transport control protocol (TCP) acknowledgment is equal to the packet in the most recent TCP acknowledgment (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8, 9, 17-24 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Liu et al., U.S. Patent Number 6,934,257 (hereinafter Liu)** as applied to claims 5, 16 and 34 above, and further in view of **LoGalbo et al., U.S. Patent Number 6,947,446 (hereinafter LoGalbo)**.

Regarding claims 8, 9, 17, and 35, Liu teaches all the limitations of claims 5, 16 and 34. Although, Liu teaches reliability generally refers to error detection and packet recovery (see col. 4, lines 5-7), Liu fails to explicitly teach an apparatus and a method, further comprising checking each of the plurality of data blocks in the network packet frame using a forward error correction (FEC) information scheme attached to the network packet frame to determine whether a particular data block in the plurality of data blocks is correct or recoverable. However, using a forward error correction (FEC) information scheme attached to a network packet frame to determine whether a

particular data block in the plurality of data blocks is correct or recoverable is very well known in the as taught for example by LoGalbo.

In an analogous field of endeavor, LoGalbo teaches using a forward error correction (FEC) information scheme attached to a network packet frame to determine whether a particular data block in the plurality of data blocks is correct or recoverable (see col. 13, lines 20-47 and Fig. 6).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the forward error correction (FEC) information scheme of LoGalbo in the system of Liu, in order to allow the effective transfer of IP based packetized data between endpoints of a communication system by mitigating the error pone nature of one or more wireless links as taught by LoGalbo (see col. 16, lines 55-65).

Regarding claim 18, Liu in view of LoGalbo teaches all the limitations of claim 17. Liu in view of LoGalbo further teaches a method, wherein said checking is configured for sending an acknowledgment by said receiving-node to said sending node with reference to a transmitted network packet frame in response to said plurality of data blocks being correct or recoverable (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 19, Liu in view of LoGalbo teaches all the limitations of claim 17. Liu in view of LoGalbo further teaches a method, wherein said checking is configured for sending a partial acknowledgment from said receiving node to said sending node with respect to a transmitted network packet frame, in response to said plurality of data

blocks being corrupt or unrecoverable (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 20, Liu in view of LoGalbo teaches all the limitations of claim 19. Liu in view of LoGalbo further teaches a method, wherein said checking is configured for transmitting a negative acknowledgment from said receiving node to said sending node to request retransmission of an entire network packet frame, in response to determining that said number of corrupt data blocks in said plurality of data blocks exceeds a threshold and said retransmitted data blocks are corrupt (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 21, Liu in view of LoGalbo teaches all the limitations of claim 19. Liu in view of LoGalbo further teaches a method, wherein said sending of said partial acknowledgment comprises piggybacking the unrecoverable or the corrupt data blocks in a subsequent network packet frame transmission from said sending node to said receiving node (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 22, Liu in view of LoGalbo teaches all the limitations of claim 21. Liu in view of LoGalbo further teaches a method, wherein upon said sending node receiving a partial acknowledgment from said receiving nodes, said sending node piggybacks unreceived data blocks on the data frames which will be transmitted next (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Regarding claim 23, Liu in view of LoGalbo teaches all the limitations of claim 22. Liu in view of LoGalbo further teaches a method, wherein the space for said piggyback

comprises space in the network data frame which is approximately 800 bytes in length (see col. 5, lines 15-25).

Regarding claim 24, Liu in view of LoGalbo teaches all the limitations of claim 23. Liu in view of LoGalbo further teaches a method, wherein said sending node retransmits the entire data frame if the maximum retransmission time is not exceeded when said sending node receives a negative frame transmission acknowledgment (see *Liu*, col. 3, line 60 through col. 4, line 7 and col. 6, lines 11-52).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cunningham et al., U.S. Patent Number 7,174,386 discloses system and method for improved performance using tunable TCP/IP acknowledgement.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony S. Addy whose telephone number is 571-272-7795. The examiner can normally be reached on Mon-Thur 8:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc M. Nguyen can be reached on 571-272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A.S.A

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